CLEAN WATER. NATURALLY.

HaloKlear®
NATURAL FLOCCULANTS

BHR-P50 TEST INSTRUCTIONS

Method for the Determination of
Residual Aluminum in Treated Water.

DOBER

DESCRIPTION:

Described is the method for the determination of residual Aluminum in treated water. This method is only valid for water treated with hybrid products such as BHR-P50.

This method is based on the development of a color change during the chemical reaction between aluminum and Eriochrome Cyanine R. A pink to red color will form when aluminum reacts with Eriochrome Cyanine R.

When using Eriochrome Cyanine R dye, soluble dilute aluminum solutions at pH of 6.0 produce a red to pink complex. The intensity of the developed color is influenced by the aluminum concentration, reaction time, temperature, pH, alkalinity, and concentration of certain other ions in the sample.

For this method the LaMotte Aluminum test kit will be used. This test kit has all the materials needed for the detection of aluminum in water. The range and sensitivity for this test kit is 0 - 0.5 ppm Al3+ in distinct concentrations of 0, 0.1, 0.15, 0.2, 0.25, 0.3, 0.4, 0.5 ppm Al3+. The reading in the LaMotte test kit must be multiplied by 3 when aluminum is in the form of polyaluminum chloride from BHR-P50. Therefore, aluminum concentrations determined by the HaloKlear test kit go from 0, 0.3, 0.6,…up to 1.5 ppm in increments of 0.3 ppm.

WHEN TO PERFORM TESTING:

Testing for residual aluminum should be repeated as often as necessary to remain in compliance with the permit-required schedule for effluent water quality testing, and in accordance with Federal, State or local regulations. In addition, retesting should be performed any time there is a significant change to the system. These changes can include, but are not limited to, changes in flow or quality of influent water, such as those caused by weather events, or the changes may be major equipment alterations. Retesting may also be required by adjustments to the effluent water quality standards.

PURPOSE:

The method is for use as a field test to determine if the residual aluminum concentration in post-treatment water is above or below 0.3 mg/L. Results that indicate residues that exceed 0.3 mg/L signal that further inspection and maintenance is needed in the storm water clarification system.

EQUIPMENT AND MATERIALS:

- (2) 125 ml container with lids (supplied)
- (1) Glass fiber filter (25 mm, 100 count), Ahlstrom Grade 161, Cat # 1610-0250 (supplied)
- (1) Filter holder (25 mm) (supplied)
- (1) Syringe 1 ml (supplied)
- (1) Syringe 20 ml (supplied)
- (1) Syringe 10 ml (supplied)
- LaMotte Aluminum Test Kit, Order Code: 3569-01 (supplied)
- HaloKlear BHR-P50 solution (supplied)
- Distilled or de-ionized water (not included)

NOTES:

- Equivalent equipment may be used.
- The filter holder (25mm) is intended to be reused.
- The filter holder must be thoroughly clean and dry between uses.
- The syringes can be reused if thoroughly cleaned.
- The 125 ml cups may be reused if thoroughly cleaned.
- The glass fiber filters are for one time use only and not to be reused.

SAFETY WARNING!

Use caution when handling any chemicals. Wear correct personal protection when performing this procedure. Dispose of all chemicals properly following all local, state, and federal regulations.

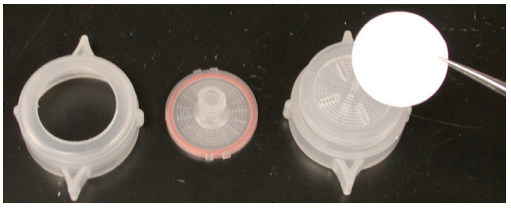
PROCEDURE:

The individual that will perform field-testing should familiarize themselves with this method and with the expected color change results. All field testers should run this method in a controlled environment before attempting the test in the field.
The assessment is performed by testing a blank clean water solution, and an Aluminum containing solution with known Aluminum concentration. This method is used to determine whether Aluminum is in solution and is above the target concentration of 0.3 mg/L (ppm).

PART 1: *Background Sample – Determining amount of naturally occurring aluminum*

Step 1: Collect a background sample of the water to be tested prior to any treatment with BHR-P50, label accordingly.

Step 2: Load a new clean glass fiber filter into the clean 25 mm filter holder and secure (as shown in the picture to the right).



Step 3: Fill the 10 ml syringe with the background sample and then attach the filter holder from **Step 2**. Filter a total of 10 ml through the filter and collect the filtrate into a clean test tube from the LaMotte Aluminum test kit.

Step 4: Immediately perform **Part 5**.

Step 5: Record results *(see HaloKlear spreadsheet)*.

PART 2: *Treated Field Sample – Determining if any residual BHR-P50 flocculant is in effluent*

Step 1: With treated sample repeat **Steps 1 – 4** in **Part 1** including LaMotte Test **Part 5**.

Step 2: Record results *(see HaloKlear spreadsheet)*.

PART 3: *Blank Solution (No Aluminum)*

Step 1: Fill a clean test tube from the LaMotte Aluminum test kit with 10 mL of new clean **distilled** or **de-ionized** water, label accordingly.

Step 2: Immediately perform **Part 5**.

Step 3: Record results *(see HaloKlear spreadsheet)*.

PART 4: *Standard Solution 0.3 mg/L (0.3 ppm) Aluminum [BHR-P50 does 10 mg/L]*

Step 1: Using the 20 ml syringe (multiple times) carefully add 99 ml total of **distilled** or **de-ionized** water to a clean 125 ml container.

Step 2: Place a clean 1 ml syringe into the bottle of BHR-P50. Slowly draw up the BHR-P50 to exactly the 1 ml mark.

Step 3: Dispense the 1 ml of BHR-P50 into the 125 ml container with the clean water and mix well. Label accordingly.

Step 4: Using the 20 ml syringe (multiple times) carefully add 99 ml total of distilled or de-ionized water to another clean 125 ml container.

Step 5: Place a clean 1 ml syringe into the solution from **Step 3** and slowly draw up the solution to exactly the 1 ml mark.

Step 6: Dispense the 1 ml of solution from **Step 3** into the other clean 125 ml container with the clean distilled or de-ionized water and mix well. Label accordingly.

Step 7: Place a clean 10 ml syringe into distilled or de-ionized water and slowly draw up the water to exactly the 9 ml mark.

Step 8: Place the 10 ml syringe with 9 ml of clean distilled or de-ionized water from **Step 7** into the solution from **Step 6** and slowly draw up the syringe to exactly the 10 ml mark and then mix well.

Step 9: Add the solution from **Step 8** into a clean test tube from the LaMotte Aluminum test kit.

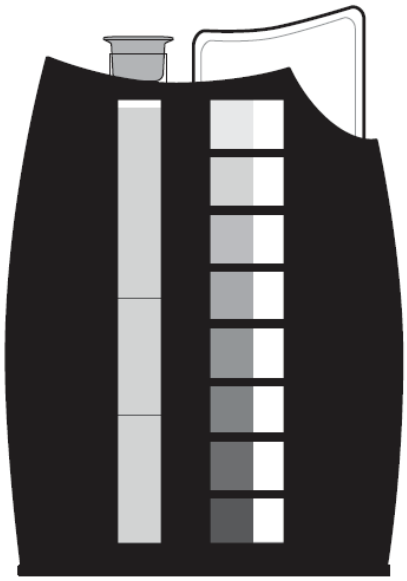
Step 10: Immediately perform **Part 5**.

Step 11: Record results *(see HaloKlear spreadsheet)*.

PART 5: *LaMotte Aluminum Test Kit Method*

ALUMINUM KIT
OCTA-SLIDE 2, 0-0.5 PPM
CODE 3569-01

Quantity	Contents	Code
50	Aluminum #1 Tablets	3943-II
50	Aluminum #2 Tablets	3944-II
2	Test Tubes, 10 ml, glass, w/cap	0822
1	Tablet Crusher	0175
1	Aluminum Octa-Slide 2 Bar, 0-0.5 ppm	7400-01
1	Octa-Slide 2 Viewer	1101



The Octa-Slide 2 Viewer should be held so non-direct light enters through the back of the Viewer. Insert the reacted sample into the top of the Viewer. Slide the Octa-Slide 2 Bar into the Viewer and match the color of the reaction to the color standards.

SAFETY WARNING!
This set contains chemicals that may be harmful if misused. Read cautions on individual containers carefully. Not to be used by children except under adult supervision.

PROCEDURE CONTINUED:

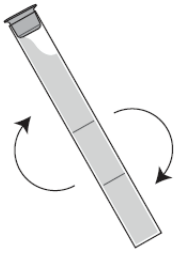
PART 5: *LaMotte Aluminum Test Kit Method*

1. Fill test tube (0822) to the 10 ml line with sample water.

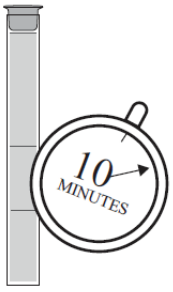
2. Add one Aluminum #1 Tablet (3943). Crush with tablet crusher (0175) to disintegrate.

3. Add one Aluminum #2 Tablet (3944). Crush with tablet crusher (0175) to disintegrate.

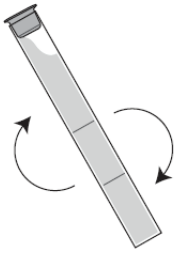
4. Cap and Mix.



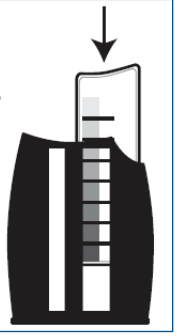
5. Wait 10 minutes.



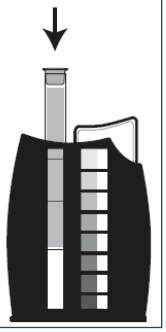
6. Mix the solution.



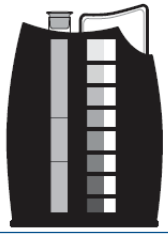
7. Insert Aluminum Octa-Slide 2 Bar (7400-01) into the Octa-Slide 2 Viewer (1101).



8. Insert test tube into Octa-Slide 2 Viewer.



9. Match sample color to a color standard. Record as ppm Aluminum.



RESULTS:

The picture below and to the left shows the LaMotte color test results for 0.0 ppm Aluminum. And the picture below and to the right shows the LaMotte color test results for 0.1 ppm Aluminum.

PART 6: *Calculations*

Step 1: Subtract background detected aluminum from **Part 1, Step 5** from treated sample detected aluminum result recorded in **Part 2, Step 2** *(see HaloKlear spreadsheet)*.

Step 2: Take the amount of Aluminum **detected** from **Part 6, Step1** and multiply by 3 to get the **total** amount of Aluminum in the treated sample *(Zero or negative calculation indicates reduction or elimination of total aluminum)*.

PART 7: *Results*

Step 1: Report the **total** amount of Aluminum calculated from **PART 6, Step 2** for the Treated Field Sample *(see HaloKlear spreadsheet)*.

Step 2: The **total** amount of Aluminum calculated from **PART 3, Step 3** should be 0.0 ppm. If not test again, remake the solutions if necessary.

Step 3: The **total** amount of Aluminum calculated from **PART 4, Step 11** for the Standard Solution should be 0.3-0.6 ppm. If not test again, remake the solutions if necessary.

PRODUCT FACTS

BHR-P50
HYBRID FLOCCULANT

Description

HaloKlear's unique hybrid flocculant, **BHR-P50**, offers a greener alternative to commodity chemicals. Our blend is free of acrylamide monomers and is part of our continued efforts to innovate towards more eco-friendly water treatment solutions. From industrial wastewater clarification to nutrient control in ponds and lakes, **BHR-P50** offers a wide range of performance benefits without increasing costs.

Industry Applications

- Stormwater management
- Construction
- Water remediation

Deployment Method

The liquid **BHR-P50** is deployed similar to commodity polyaluminum chloride. Typical application uses metering pumps. **BHR-P50** can be applied using several delivery methods, including semi-passive and active systems.

Packaging

Lot Number must be legible on each container. Container types: 275-gallon IBC tote with camlock or threaded outlet, 55-gallon drum or 5-gallon pail.

Handling and Storage

All containers must be free of leaks, damage, and gross contamination. Product should be maintained between 40˚F and 90˚F. Keep from freezing.

Product Benefits

- **High Shear Strength & Filterability**
- **Dense Floc That is Easily Dewaterable**
- **Low Bioaccumulation of Inorganic Salts**
- **Low Ecotoxicity Profile**
- **Effective Across a Wide Spectrum of Variables, including pH, salinity, etc.**

Product Properties

Appearance	Homogenous white-to-yellow opaque liquid
Viscosity	500 – 1,300 cP
Specific Gravity	0.95 – 1.15
pH	2.3 – 3.7
LC50	392 ppm C Dubia, 48 hour acute

Field Handling Recommendations

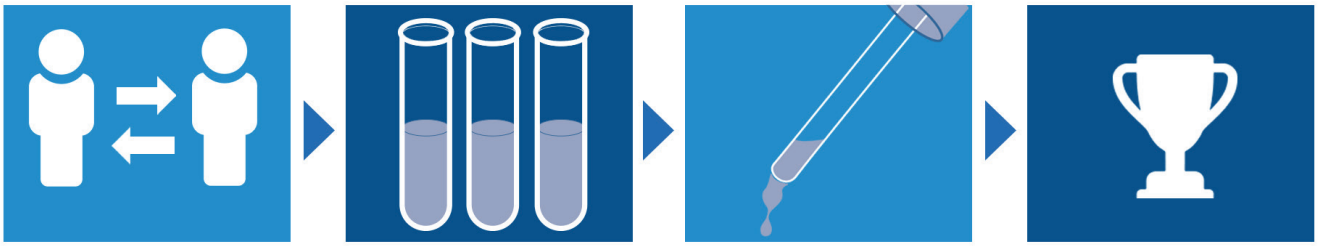
Keep out of direct sunlight. Some separation may occur but will not affect performance. For more information, contact your Dober representative.

Safety Data

BHR-P50 is a corrosive substance. Before handling this material read the corresponding Material Safety Data Sheet for safety and health data.

CAN'T FIND THE RIGHT DOSAGE? CONTACT US!

OUR PROCESS



Tell us about your treatment needs

Send us your water and we'll provide you with a solution to your problem or we can send product samples to you for testing.

Add our solution to your treatment process, problem solved.

Use our residual test kit to prove the results.

VALIDATE RESULTS ON THE SPOT!

With HaloKlear's Residual Test Kit, you can prove, onsite, that no residual chemistry is being released back into the environment. View results in 10 minutes or less, at a cost of only a few dollars per test!

HaloKlear®
NATURAL FLOCCULANTS

For additional information contact us at: 800.323.4983
info@dober.com • www.dober.com/water_treatment

HaloKlear's portfolio consists of 100% biodegradable chitosan-based, natural flocculants as well as iron-and sulfate-free hybrid flocculants. HaloKlear technologies address a wide variety of pollutants and contaminant types, including total suspended solids, algae, hydrocarbons, heavy metals, oils and organic compounds.

DOBER

Line	Instruction	Example 1	Example 2	Test Data 1	Test Data 2	
A	Record effluent aluminum concentration	0.2	0.1			mg/L
B	Record background aluminum concentration	0.3	0			mg/L
C	Subtract B from A	-0.1	0.1			mg/L
D	Multiply C times 3*	0	0.3			mg/L of BHR-P50 residual

* if number is zero or negative enter “0” in line D

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